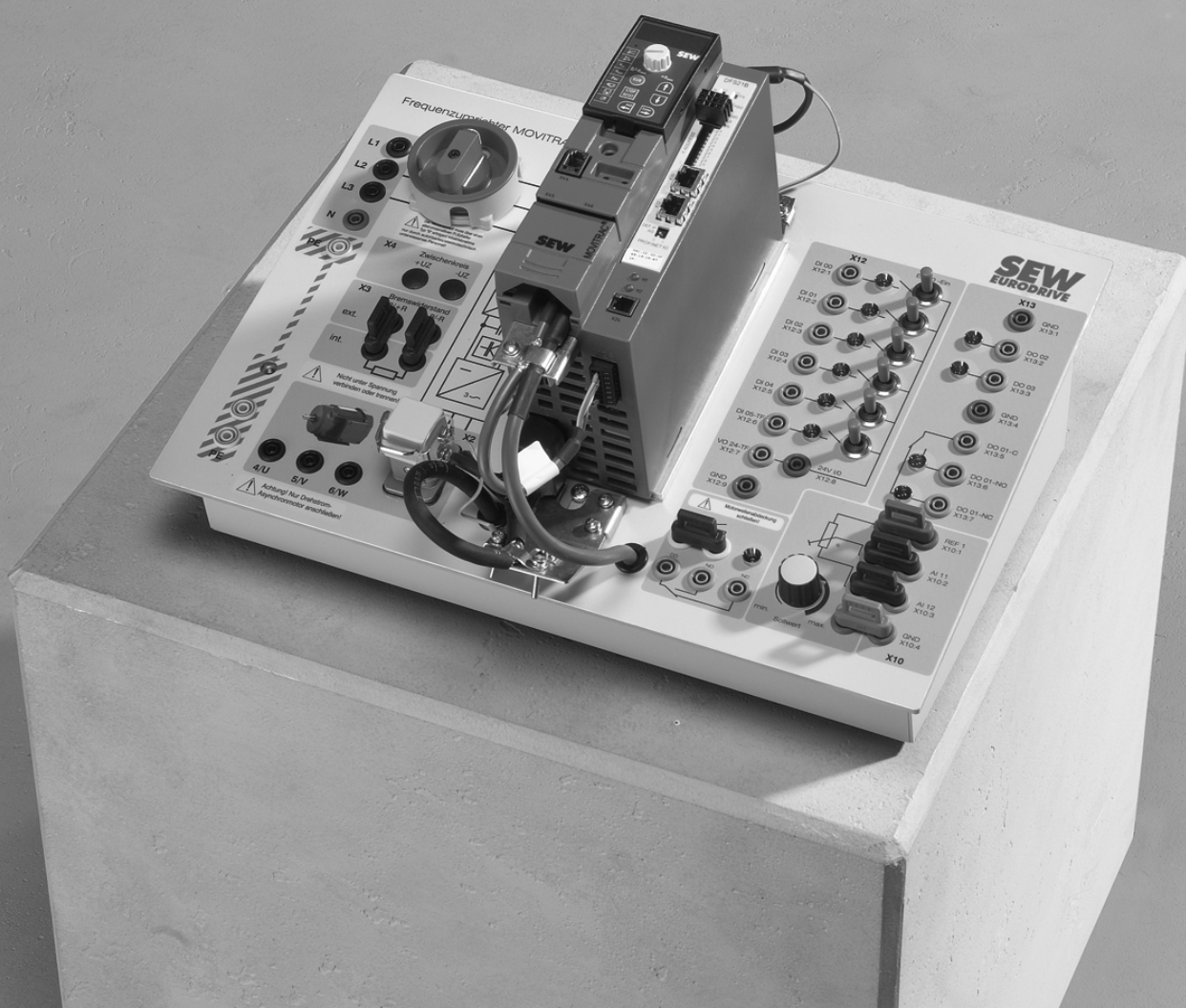




SEW
EURODRIVE

Operating Instructions



Didactics – Electromechanics

MOVITRAC® B Frequency Inverter Module (MCB 5A3)



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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent hazard	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.2.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



SIGNAL WORD

Type and source of hazard.




Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard

Hazard symbol	Meaning
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of automatic restart

1.2.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

⚠ SIGNAL WORD Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.3 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

1.4 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.5 Applicable documentation

Observe the following applicable documents:

- "MOVITRAC® B" operating instructions
- "MOVITRAC® B" system manual
- "MOVITOOLS® MotionStudio" online help
- Operating instructions of the motor in use

Always use the latest edition of documentation and software.

The SEW-EURODRIVE website (www.sew-eurodrive.com) provides a wide selection of documents for download in various languages. If required, you can also order printed and bound copies of the documentation from SEW-EURODRIVE.

1.6 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.7 Copyright notice

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2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Target group

The product is intended for persons in training facilities that are equipped with the appropriate furnishings in classrooms and laboratories. Furnishings are, for example, experimental stands, laboratory benches, energy cells, control panels and control consoles as well as control cabinets with pick-up positions for electrical energy.

The focus is on the transfer of knowledge to non-specialists. Before using the products, non-specialists must be instructed about the safety-relevant aspects described in this document.

Specialist for mechanical work

Any mechanical work on the products must be carried out by a qualified specialist. Specialists in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualification in the field of mechanical engineering in accordance with the national regulations.
- They are familiar with this documentation.

Specialist for electrotechnical work

Any electrical work on the products must be carried out by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualification in the field of electrical engineering in accordance with the national regulations.
- They are familiar with this documentation.

Additional qualification

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation. The persons must have the express authorization of the company to operate, program, parameterize, label, and ground units, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is that the persons are capable of performing the required tasks and work steps in a safe and correct manner.

2.3 Designated use

The product is designed for training purposes only. Operating the product in private, craft, trade or for industrial purposes is not permitted. The product is not intended for installation in electrical plants or machines. The product is not intended for use in applications (such as lifting applications).

The product can be used for operating AC asynchronous motors with squirrel-cage rotors. The product is not suited for operating AC synchronous motors.

Startup (i.e. start of regular operation) is permitted with adherence to EMC guideline only.

Technical data and information on the connection conditions are provided on the nameplate and in the documentation. Comply with the data and conditions.

2.4 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

- Before transportation, cover the connections with the supplied protection caps.
- Place the product only on the base plate during transport.
- Ensure that the product is not subject to mechanical impact.

If necessary, use suitable, sufficiently dimensioned handling equipment.

2.5 Setup and installation

Ensure that the product is installed and cooled according to the regulations in the documentation.

The product is suited for operation on laboratory benches and on tables. Use standard laboratory or training equipment where the products can be placed properly and safely without posing any risk to the learners.

Protect the product from strong mechanical strain. The product and its mounting parts must never protrude into the path of persons or vehicles. Ensure that components are not deformed and insulation spaces are not changed, particularly during transportation and handling. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless the device is explicitly designed for such use:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use at an elevation of more than 4000 m above sea level

2.6 Electrical connection

Familiarize yourself with the applicable national accident prevention regulations before working on the product.

Perform electrical installation according to the pertinent regulations (e.g. cable cross-sections, fusing, protective conductor connection).

Ensure that all of the required covers are correctly attached after the electrical installation.

The preventive measures and protection devices must comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

Ground connections are required as preventive measures.

2.7 Startup and operation

Before startup, make sure that the 4 mm sockets, buttons, and switches are intact.

It might be necessary to equip locations where such devices are used with additional monitoring and protection devices in accordance with the respective applicable safety regulations, e.g. the law governing technical equipment, accident prevention regulations, etc.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts, as well as hot surfaces during operation.

Cover unused connections with the supplied protection caps during operation.

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This also applies even when the product is inhibited and the motor is at standstill.

Electric shock due to moving the device while voltage is applied. Do not move the product while voltage is applied.

Do not separate the connection to the product during operation. This may result in dangerous electric arcs damaging the product.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

10 minutes.

Observe the corresponding information signs on the product.

The fact that the operation LED and other display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect the product from the supply system and then start troubleshooting.

2.8 Inspection and maintenance

Only perform maintenance and repair work once the product has been secured and disconnected from the power supply. Ensure a de-energized state of the product before you start working on it. Ensure a de-energized state for the entire time you work on the product.

Repair work may only be carried out by SEW-EURODRIVE.

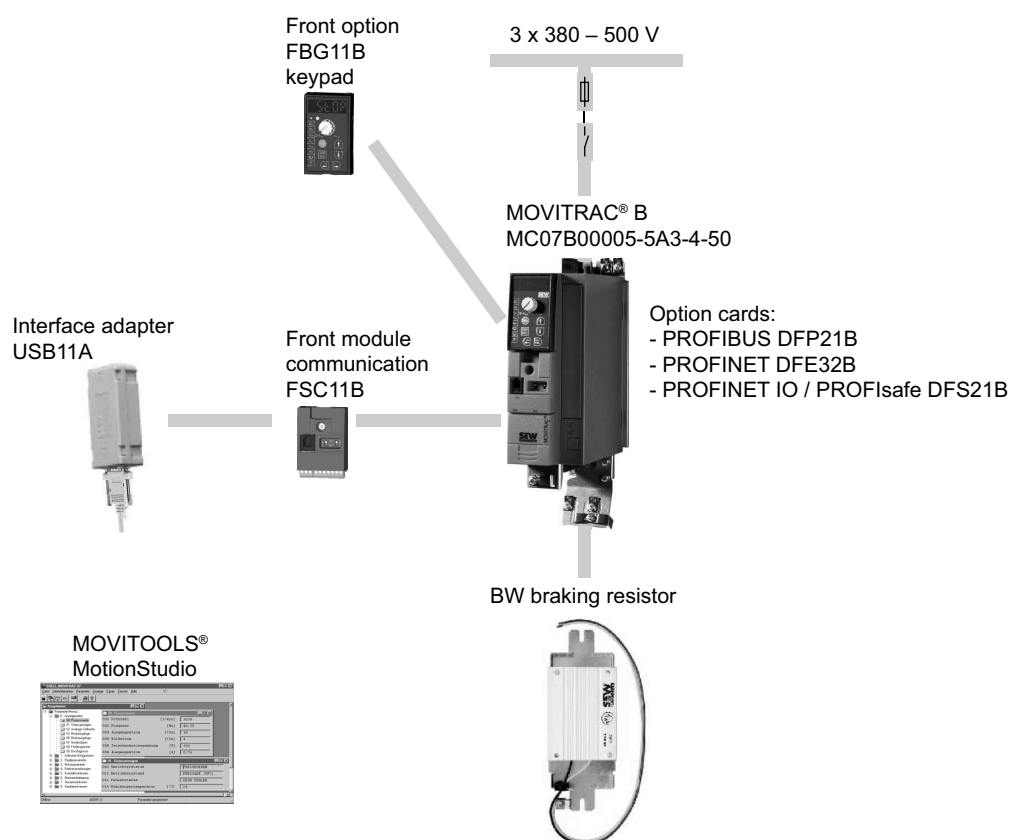
3 Device structure

3.1 Scope of delivery

The following components are included in the delivery:

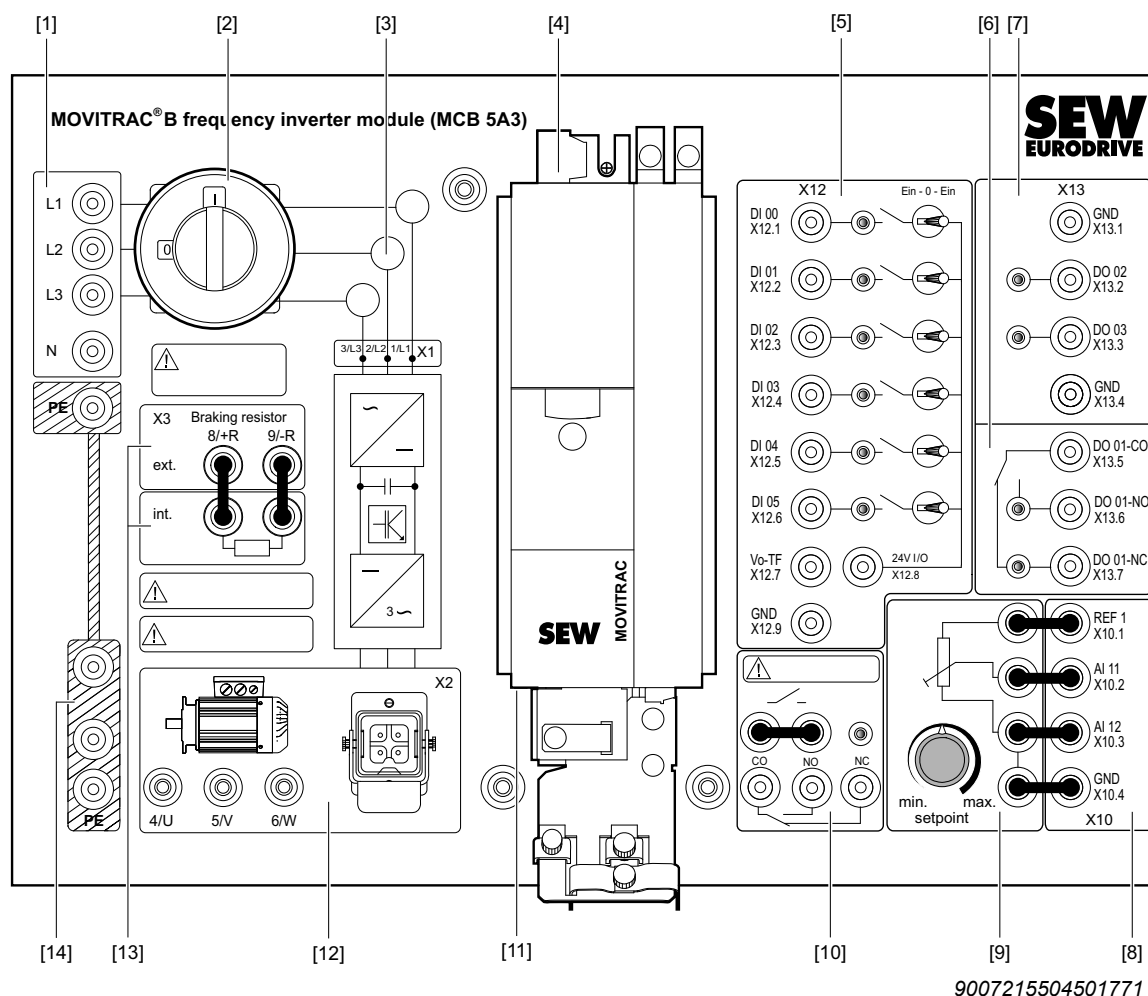
- Front plate
- Housing
- Assembled and checked printed circuit board for the power section
- Braking resistor
- MOVITRAC® B frequency inverter
- FBG11B keypad
- 24 V power supply (integrated in the module)
- USB11A interface adapter
- MOVITOOLS® MotionStudio engineering software
- Optional: Fieldbus interface
- FSC11B communication front module
- 7 jumpers (5 black, 1 blue, 1 red)

3.2 Overview of the system



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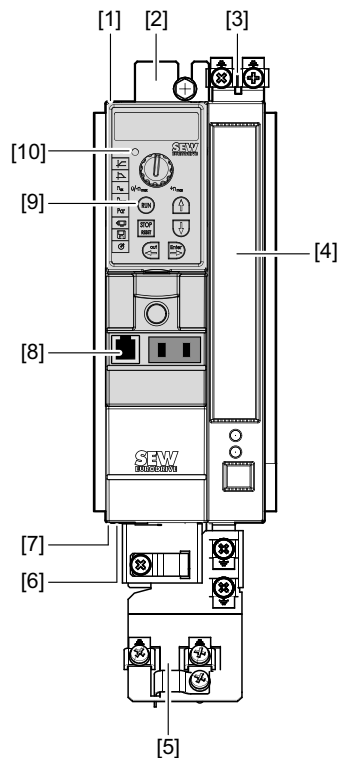
3.3 Basic unit



- | | |
|--|---|
| [1] Power connection | [8] X10: Analog input |
| [2] Main switch (can be locked) | [9] Analog inputs for connection to X10 (potentiometer) |
| [3] Power indicator | [10] Protection cover connection |
| [4] MOVITRAC® B frequency inverter (MCB 5A3) | [11] X17 STO (safe torque off) |
| [5] X12: Digital inputs | [12] X2: Motor connection |
| [6] X13: Relay outputs | [13] X3: Braking resistor |
| [7] X13: Digital outputs | [14] PE: PE connection |

3.4 Device components

3.4.1 MOVITRAC® B



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- [1] X1: Line connection 3-phase: L1/L2/L3/PE
- [2] Fixing strap
- [3] PE connection
- [4] Option card slot

SEW-EURODRIVE recommends:

- PROFIBUS DFP21B (part number 18235395)
- PROFINET DFE32B (part number 18235425)
- PROFINET IO / PROFIsafe DFS21B (part number 18211836)

- [5] Shield plate for motor cable, fixing strap underneath
- [6] X2: Motor connection U/V/W / brake connection +R/-R
- [7] X17: Safety contact for STO (safe torque off)
- [8] FSC11B communication interface (part number 18207162) with RS485 and SBus (CAN)
- [9] Optional keypad, plugged
- [10] Status LED (visible without optional keypad)

3.4.2 USB11A interface adapter

INFORMATION

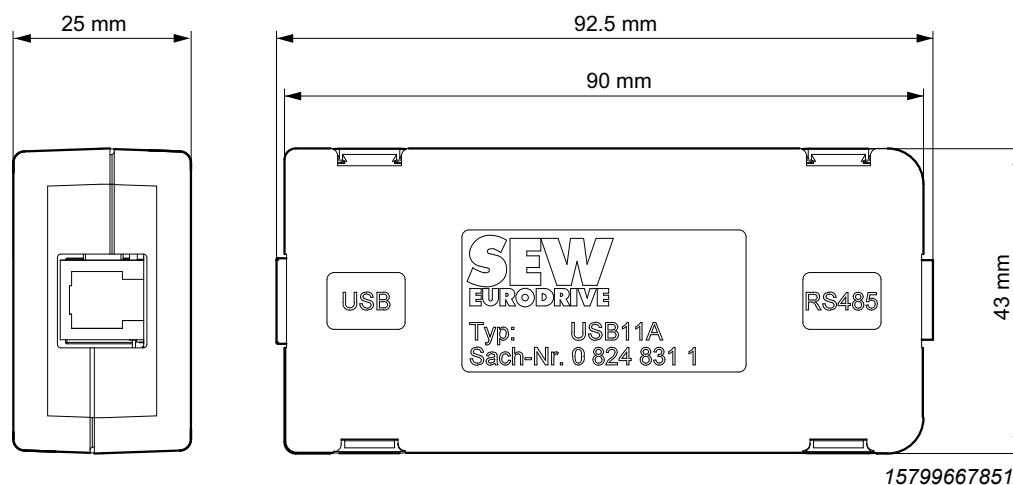


FSC11B/12B, FSE24B or FIO11B/21B is required for connecting the USB11A.

The USB11A option can be used to connect a PC or laptop with USB interface to the XT slot of MOVITRAC® B. The USB11A interface adapter supports USB 1.1 and USB 2.0.

The USB11A option is connected to the PC using a commercially available, shielded USB connection cable of the type USB A-B.

The USB11A option is connected to MOVITRAC® B and MOVITRAC® B is connected to USB11A using a serial interface cable with RJ10 connectors.



3.4.3 Braking resistors BW

General Information

BW braking resistors are adapted to the MOVITRAC® B inverter series. The type of cooling is natural cooling KS (air cooling).

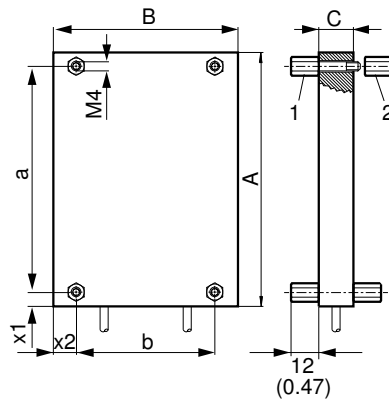
The surfaces of the resistors get very hot if loaded with P_N . Make sure that you select an installation site that will accommodate these high temperatures. For this reason, braking resistors are usually mounted on top of the control cabinet.

Plan for a load derating of 4% per 10 K from an ambient temperature of 45 °C (113 °F). Do not exceed the maximum ambient temperature of 80 °C (176 °F). When installed in the control cabinet, note the maximum permissible temperature of other components (e.g. MOVITRAC® B).

Flat design

Flat-design resistors have IP54 enclosure and are equipped with internal thermal overload protection (cannot be replaced). Depending on their type, you can install the resistors as follows:

- With support rail mounting FHS or submounting FKB under the heat sink. Sub-mounted braking resistors do not reach the specified CDF power. The FHS and FKB options are only suitable for the BW027-003 and BW072-003 braking resistors.
- Attach to a mounting rail using a BS touch guard.



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Type	Main dimensions in mm			Fastening in mm				Mass kg
	A	B	C	a	b	x1	x2	
BW072-003	110	80	15	98	60	6	10	0.3

400/500 V

Braking resistor type	BW072-003
Part number	8260583
100% cdf	230 W
50% cdf	310 W
25% cdf	420 W
12% cdf	580 W
6% cdf	1000 W
Resistance value R_{BW}	$72 \Omega \pm 10\%$
Trip current of external bimetal relay	0.6 A
Ambient temperature ϑ_A	-20 °C to +45 °C
For MOVITRAC® B 400/500 V	0003 – 0040

3.4.4 Motor types

SEW-EURODRIVE recommends the following motor type for training on an asynchronous motor with simple encoder technology:

- DR.. series AC motor

Recommendation:

- Didactics motor assembly DRS71S4 (part number 18987389)
- Didactics brake motor assembly DRS71S4BE05 (part number 18984487)

4 Installation

4.1 Important information

INFORMATION



- Observe the documentation of components connected or mounted to the module (e.g. motor, inverter).
- Comply with all instructions referring to the technical data and the permissible conditions where the device is operated.



⚠ WARNING

Electric shock when disconnecting or connecting voltage-carrying plug connectors.
Severe or fatal injuries.

- Disconnect all supply voltages.
- Make sure that the device is de-energized.
- Never plug or unplug the plug connectors while they are energized.



⚠ CAUTION

Short circuit due to incorrectly set jumpers.
Damage to property and injury.

- Insert the jumpers only in the contact points provided for this purpose.

INFORMATION



Only connect AC asynchronous motors to the device output.

4.1.1 Device output

Only connect ohmic/inductive load (motor).

4.1.2 Digital outputs

The digital outputs are short-circuit proof and protected against external voltage up to 30 V. Higher external voltages can destroy the digital outputs.

4.1.3 Cable

Use the following cables:

- Standardized safety cables for use in classrooms or laboratories.
- 4 mm laboratory safety plug connectors with rigid insulating sleeve, suited for nominal voltages of up to 1000 V.
- Didactics connection cable from SEW-EURODRIVE.

The cable must not be longer than 3 m.

4.1.4 PE line connection according to EN 61800-5-1

Earth-leakage currents of ≥ 3.5 mA can occur during normal operation. Observe the following for reliable PE connection:

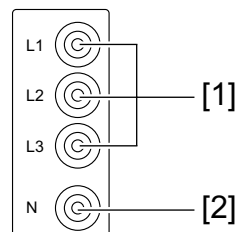
- Supply system cable $< 10 \text{ mm}^2$:
 - Second PE conductor with the same cross section as the supply system cable routed parallel to the protective earth via separate terminals, or
 - Copper PE conductor with a cross section of 10 mm^2
- Supply system cable 10 to 16 mm^2 :
 - Copper protective earth conductor with the same cross section as the supply system cable.
- Supply system cable 16 to 35 mm^2 :
 - Copper PE conductor with a cross section of 16 mm^2
- Supply system cable $> 35 \text{ mm}^2$:
 - Copper PE conductor with half the cross section of the supply system cable.

4.1.5 Interference emission

Recommendation: Use shielded motor cables for EMC compliant installation.

4.2 Electrical connections

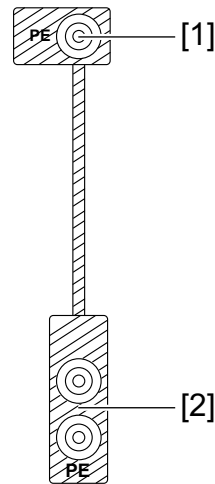
4.2.1 Power connection



14979184907

- [1] L1 – L3: Line connection phases
[2] N: Line connection of neutral conductor

4.2.2 PE connection



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- [1] PE connection for power section
[2] PE connection for motor

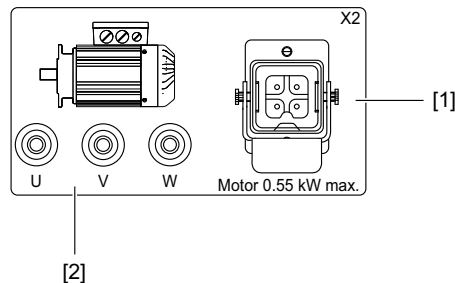
4.2.3 X2: Motor connection

NOTICE

Damage to the didactics module due to overload.

Damage to property.

- Only connect one motor to the didactics module.



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- [1] Motor connection HARTING connector type Han[®]Q5 EMC female
Article no.: Connector: 09620030301, insert: 09120053101
[2] Motor phases U, V, W

You can connect the motor via the 4 mm connections of the U, V and W motor phases, or via the connector.

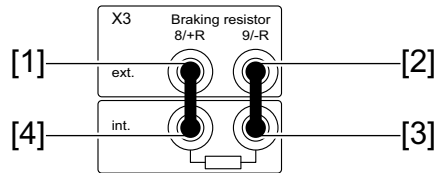
4.2.4 X3: Braking resistor (external or internal)



▲ WARNING

Electric shock when disconnecting or connecting voltage-carrying jumpers.
Severe or fatal injuries.

- Disconnect all supply voltages.
- Make sure that the device is de-energized.
- Never disconnect or connect jumpers while they are carrying voltage.



9007214234455051

- | | |
|-----|-----------|
| [1] | ext. 8/+R |
| [2] | ext. 9/-R |
| [3] | int. 8/+R |
| [4] | int. 9/-R |

Using an internal braking resistor

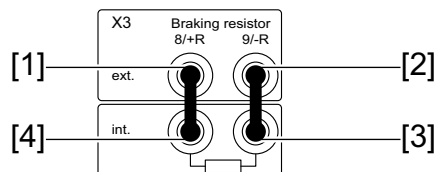
The didactics module comes equipped with a BW072-003 braking resistor.

Make sure that the braking resistor is used appropriately in motor-inverter operation. Observe the information in the documentation of the components in use.

Do the following to use the internal braking resistor:

1. Jumper terminal [1] with terminal [4].
2. Jumper terminal [2] with terminal [3].

⇒ The terminals must be jumpered as shown in the following figure.



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Using an external braking resistor

Use a braking resistor matching the selected motor.

The minimum permitted braking resistance value R_{BW_min} (4-quadrant operation) is 68 Ω.



⚠ WARNING

Risk of burns due to hot surfaces. Braking resistors reach a temperature of up to 250 °C under load.

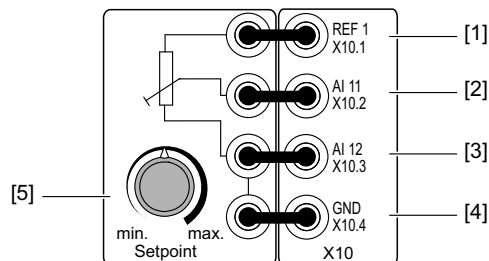
Serious injuries.

- Select a suitable installation location and observe the minimum clearance.
- Provide for covers to secure hot surfaces.
- Install the protection devices according to the regulations.
- Check the protection devices on a regular basis.

Do the following to use an external braking resistor:

1. Connect the external braking resistor to terminals [1] and [2].
⇒ Terminals [3] and [4] remain unassigned.

4.2.5 X10: Analog inputs



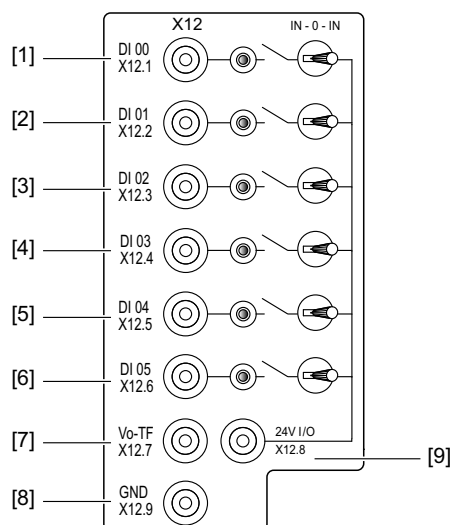
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- [1] REF 1: Reference voltage
- [2] AI 11: Analog input AI 11
- [3] AI 12: Analog input AI 12
- [4] GND: Reference potential
- [5] Potentiometer

If the jumpers are inserted between the terminals, the potentiometer is used as the analog input signal.

If you remove jumpers, you can connect another input signal via the 4 mm terminals. In this case, observe the technical specification of the frequency inverter.

4.2.6 X12: Digital inputs



7710586891

- [1] DI 00: Digital input DI 00, factory set to "Fault reset"
- [2] DI 01: Digital input DI 01, factory set to "CW/stop"
- [3] DI 02: Digital input DI 02, factory set to "CCW/stop"
- [4] DI 03: Digital input DI 03, factory set to "Enable/stop"
- [5] DI 04: Digital input DI 04, factory set to "n11/n21"
- [6] DI 05: Digital input DI 05, factory set to "n12/n22"
- [7] Vo-TF: Supply voltage for the temperature sensor
- [8] GND: Reference potential
- [9] 24 V I/O: 24 V auxiliary voltage output

You can set the digital inputs signals DI 00 through DI 05 using the switches [1] to [5] (latching to the left/spring-return to the right). Instead, you can connect the digital input signals via the 4 mm terminals. In this case, observe the technical specification of the frequency inverter.

Power supply unit

The didactics module comes equipped with a separate 24 V power supply that provides the control voltage of the frequency inverter. The power supply is necessary because the frequency inverter is used with safe technology.

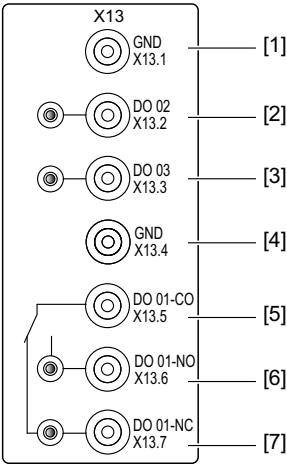
The 24 V are routed to the outside via terminal X12.8.

INFORMATION



The power supply is designed for a maximum nominal output current of 1.3 A. Overload can destroy the power supply unit.

4.2.7 X13: Digital outputs

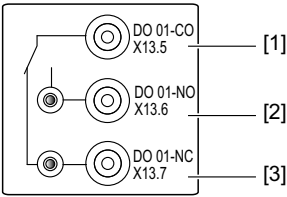


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- [1] GND: Reference potential
- [2] DO 02: Digital output DO 02, factory set to "Brake released"
- [3] DO 03: Digital output DO 03, factory set to "Ready"
- [4] GND: Reference potential

Digital output signals can be picked off from the 4 mm terminals. In this case, observe the technical specification of the frequency inverter.

4.2.8 X13: Relay outputs



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- [1] DO 01 – C: Shared relay contact
- [2] DO 01 – NO: NO contact
- [3] DO 01 – NC: NC contact

Relay output signals can be picked off from the 4 mm terminals. In this case, observe the technical specification of the frequency inverter.

4.2.9 X17: STO (Safe Torque Off)

Safety input X17 for devices with integrated functional safety:

Terminal	Designation
X17:1	GND: Reference potential for X17:2
X17:2	VO24: U_{OUT} = DC 24 V, only to supply X17:4 of the same device; must not be used to supply other devices.
X17:3	SOV24: Reference potential for DC +24 V "STO" input (safety contact)
X17:4	SVI24: DC +24 V "STO" input (safety contact)

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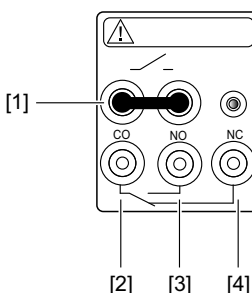
Terminal	Designation				
Permitted cable cross section	1 core per terminal: 0.75 – 1.5 mm ² (AWG21 – 15) Two cores per terminal: 0.75 – 1.0 mm ² (AWG21 – 17)				
Tightening torque	<ul style="list-style-type: none"> Min. 0.22 Nm Max. 0.25 Nm 				
	Size	Input capacitance	Min.	Typ.	Max.
Safety-related 24 V voltage supply	–	–	DC 19.2 V	DC 24 V	DC 30 V
Power consumption X17:4	0S / 0L	27 µF	–	–	3 W
	1	270 µF			5 W
	2 / 2S	270 µF			6 W
	3	270 µF			7.5 W
	4	270 µF			8 W
	5	270 µF			10 W
Time between disconnection of the safety-related 24 V voltage supply at MOVITRAC® B until disconnection of the pulse pattern at the output stage $t_{\text{switch-off}}$	0	–	–	–	20 ms
	1 – 5	–	–	–	100 ms
Time for restart	200 ms				

INFORMATION



Without a higher-level safety function, terminals X17.1/X17.3 and X17.2/X17.4 must be jumpered as in delivery state.

4.2.10 Protection cover connection



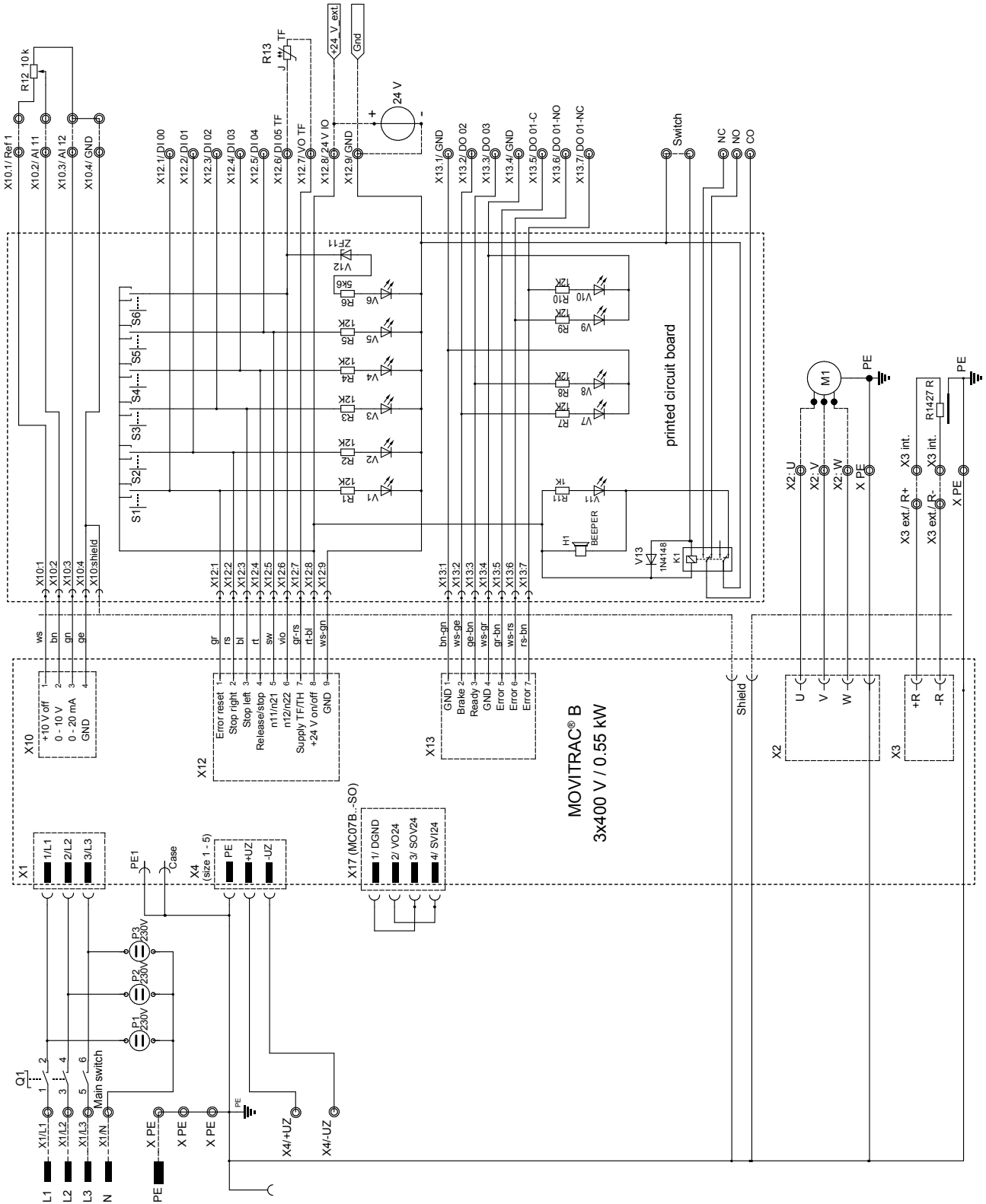
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- [1] Connection for a protection cover
- [2] CO: Change-over contact
- [3] NO: Normally open contact
- [4] NC: Normally closed contact

A safety query can be connected to the upper 2 terminals, for example a protection cover. As soon as the protection cover is opened, an acoustic warning signal is issued and the LED flashes.

If you do not use a protection cover, insert a jumper between the upper 2 terminals.

4.3 Wiring diagram



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25930273/EN – 12/2018

5 Startup

5.1 Important information



INFORMATION

- Before startup, make sure that the product is not damaged.
- Check that all protective covers are installed correctly.
- Observe the documentation of components connected or mounted to the module (e.g. motor, inverter).



⚠ WARNING

Danger of electric shock due to open connections.

Severe or fatal injuries.

- Never start the device if the touch guard is not installed.



⚠ WARNING

Risk of injury due to device malfunction caused by incorrect device setting.

Severe or fatal injuries.

- Make sure that the installation was carried out by trained specialists.
- Check the parameters and data sets.
- Only use settings that are correct for the function.



⚠ WARNING

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries.

- Ensure that the motor cannot start unintentionally, by removing the X12 electronics terminal block for example.
- Additional safety precautions must be taken depending on the application, such as monitoring systems or mechanical protection devices, to avoid injury to people and damage to machinery.



NOTICE

Danger due to arcing.

Damage to electrical components.

- Do not disconnect power connections during operation.
- Do not connect power connections during operation.



INFORMATION

To ensure fault-free operation, do not disconnect or connect signal cables during operation.

5.2 Requirement

Correct project planning for the drive is a prerequisite for successful startup.

Bear in mind the output voltage of the frequency inverter (e.g. 3-phase/230 V) when selecting the motor.

MOVITRAC® B frequency inverters are factory set to be taken into operation with the SEW motor adapted to the correct power level (4-pole, 50 Hz) in V/f control mode. This means you can take the adapted SEW-EURODRIVE motor into operation and start it without project planning.

5.3 Preliminary work

Do the following before taking the didactics module into operation:

1. Write down all the technical data of the motor nameplate. You will need this information for startup.
2. Connect the line voltage (3-phase/400 V/50 Hz) to the didactics module.
3. Define the connection type of the motor (λ or Δ), and wire the motor accordingly. Refer to the documentation for the motor for this purpose.
4. Connect the motor cable to the didactics module.
5. Start up the motor on the frequency inverter. Next, connect terminals DI 00 through DI 05 with the didactics module. Do not connect the terminals during on-going operation.
6. In the case of external control (for example when using a higher-level PLC), set all toggle switches of the didactics module to "0" (zero) position for input simulation.

INFORMATION



If you use a third-party motor, make sure the motor is suited for frequency inverter operation.

7. Apply line voltage.

5.4 Startup using FBG11B keypad

For detailed information on operating and parameterizing the MOVITRAC® B frequency inverter using the FBG11B keypad, refer to the "MOVITRAC® B" system manual.

All settings on the frequency inverter are stored safely in the frequency inverter when setting the parameters and in the event of a power failure.

5.4.1 Starting up the didactics module

1. Use the FBG11B keypad to select parameter 802. Select the value "All".
⇒ The frequency inverter is reset to its delivery state.

2. Use parameter 800 to change from the short parameter menu (short) to the detailed parameter menu (long).
 - ⇒ The short menu is active by default after having reset the frequency inverter to delivery state. In the short menu, only a few parameters of the entire list are available for selection.
3. After having reset the MOVITRAC® B frequency inverter to its factory settings, the digital inputs have the following functions:

Digital input	Function
DI 00 / X12.1	Fault – reset
DI 01 / X12.2	CW / stop
DI 02 / X12.3	CCW / stop
DI 03 / X12.4	Enable / rapid stop
DI 04 / X12.5	n11
DI 05 / X12.6	n12

4. Switch off the line voltage.
5. Connect the motor cable to the sockets provided for this purpose.
6. Switch on the line voltage.
7. To perform startup using the FBG11B keypad, press the motor icon on the FBG11B.

When you connect an AC asynchronous motor from SEW-EURODRIVE, you do not have to enter the technical data of the motor, such as nominal motor current. You only have to enter the technical data of the motor when you connect a third-party motor.

5.4.2 Checking the motor for proper operation



⚠ WARNING

Danger due to rotating parts.

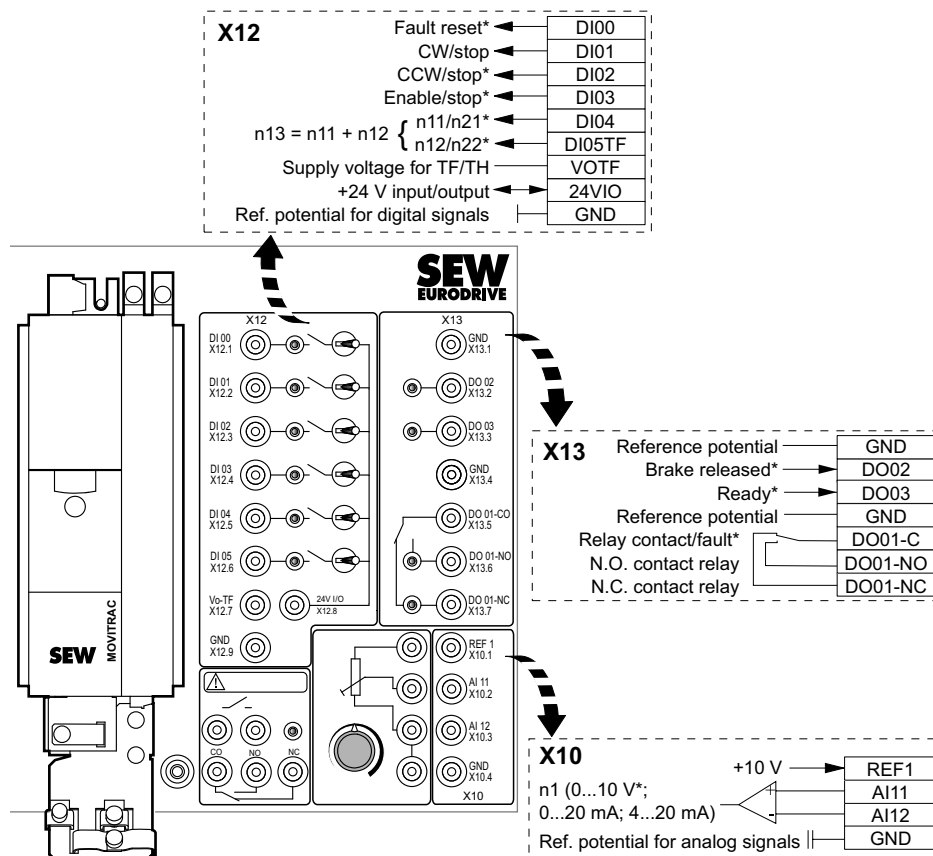
Fatal or severe injuries and damage to property.

- Keep away parts of the body and objects from the motor.

For information on manual mode using the setpoint adjuster, refer to the "MOVITRAC® B" system manual.

1. Activate manual mode of the FBG11B keypad.
2. Check the direction of rotation of the motor shaft.
3. Check the acceleration and whether the maximum speed is reached. To do so, turn the potentiometer of the FBG11B keypad to the right up to the stop.
4. After the test, stop the drive by pressing the "STOP" key on the FBG11B keypad.
5. Exit manual mode.
 - ⇒ The display of the FBG11B keypad flashes with the value "Start".
6. Enable the drive. To do so, press the green "RUN" key.

5.4.3 Factory settings



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The functions of the terminals as well as setpoint settings can be changed using the FBG11B keypad or a PC. A PC connection requires the FSC11B front module and the USB11A interface adapter.

6 Operation

6.1 Important information

INFORMATION



- Check that all protective covers are installed correctly.
- Observe the documentation of components connected or mounted to the module (e.g. motor, inverter).



⚠ WARNING

Electric shock when disconnecting or connecting voltage-carrying plug connectors.
Severe or fatal injuries.

- Disconnect all supply voltages.
- Make sure that the device is de-energized.
- Never plug or unplug the plug connectors while they are energized.



⚠ CAUTION

Risk of burns due to hot surfaces of the device or connected options, e.g. braking resistors.

Injury.

- Provide for covers to secure hot surfaces.
- Install the protection devices according to the regulations.
- Check the protection devices on a regular basis.
- Let the device and the connected options cool down before you start working on them.



⚠ WARNING

Danger of electric shock. Dangerous voltage levels may still be present inside the inverter and at the terminals up to 10 minutes after disconnection from the supply system.

Severe or fatal injuries.

- Wait at least 10 minutes after you switched off the inverter before you start working on it.

6.2 Status displays

The LEDs of the didactics module indicate whether a signal is present at the input triggered by the switch/button. A certain action is triggered in the inverter depending on how the inputs of the didactics module were programmed.

Refer to the keyword "Input/output assignment" in the documentation for the inverter.

6.3 MOVITOOLS® MotionStudio

The MOVITOOLS® MotionStudio program includes:

- Parameter tree
- Startup
- SCOPE
- Application Builder
- Data management

You can perform the following functions with the device:

- Take it into operation
- Set parameters
- Visualize and diagnose

6.3.1 SCOPE

SCOPE for MOVITOOLS® MotionStudio is an oscilloscope program for the inverters of SEW-EURODRIVE. SCOPE allows you to optimize the drives yourself. The inverter records, for example, response functions to setpoint changes in real time. You can transfer this information to the PC and graphically display it. SCOPE shows up to four analog and digital measured variables in differently colored curves. You can scale both the x-axis and the y-axis as required.

SCOPE also enables you to record digital input and output signals of the inverter. This means you can record complete program sequences of the higher-level controller and then evaluate them.

SCOPE supports simple documentation of the set parameters and the recorded measurement data by providing the following functions:

- Save
- Meta data
- Print

The online help functions enable you to familiarize yourself quickly with how to use SCOPE.

SCOPE is a multi-document interface (MDI application). This interface enables you to observe and analyze several data sets simultaneously. SCOPE displays every new data set in a new window. All settings for viewing and editing the data set take effect in the active window only.

7 Service

7.1 Electronics Service by SEW-EURODRIVE

If you are unable to rectify a fault, contact SEW-EURODRIVE Service. For the addresses, refer to www.sew-eurodrive.com.

When contacting the SEW-EURODRIVE service, always specify the following information so that our service personnel can assist you more effectively:

- Information on the device type on the nameplate (e.g. type designation, serial number, part number, product key, purchase order number)
- Brief description of the application
- Fault message on the status display
- Nature of the fault
- Accompanying circumstances
- Any unusual events preceding the problem

7.2 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.

- Screens
- Capacitors

8 Technical data

MOVITRAC® B frequency inverter module (MCB 5A3)	
Degree of protection	IP20
Power supply connection	3-phase
Connection voltage	AC 400 V
Line frequency	50 Hz
Nominal output current 100% operation	AC 2.0 A
Weight	Approx. 5.5 kg
Dimensions W × H × D	420 mm × 295 mm × 290 mm
Ambient temperature	-10 °C to +50 °C
Storage temperature	-25 °C to +75 °C
Protection cover connection/relay output:	
Control voltage	24 V
Maximum control voltage	30 V
Nominal current	8.3 mA
Maximum current	800 mA
Resistance value	2880 Ω
Devices and part numbers	
Board with MOVITRAC® B frequency inverter	<ul style="list-style-type: none"> • With digital/analog interface Part number: 18985483 • With PROFINET interface Part number: 18985386
Inverter	MOVITRAC® B size 0S Part number: 08289956

Devices and part numbers	
Inverter accessories	<ul style="list-style-type: none"> • FBG11B keypad Part number: 18206352 • USB11A interface adapter Part number: 08248311 • FSC11B communication interface Part number: 18207162 • Fieldbus interface (optional) <ul style="list-style-type: none"> – PROFIBUS DFP21B Part number: 18235395 – PROFINET DFE32B Part number: 18235425 – PROFINET IO / PROFIsafe DFS21B Part number 18211836 • MOVITOOLS® MotionStudio engineering software

9 Standards and certifications

The SEW-EURODRIVE components were developed and tested based on the latest, national standards and certifications.

If special approvals are necessary for additional requirements, request them separately from SEW-EURODRIVE.

9.1 EC declaration of conformity

The EC declarations of conformity for the SEW components are listed on the website of SEW-EURODRIVE with the respective products.

9.2 Certifications

The certificates for the SEW components are listed on the website of SEW-EURODRIVE with the respective products.

10 Address list

Germany			
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Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
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Driving the world

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